

# The Endocrine system

## Hormones

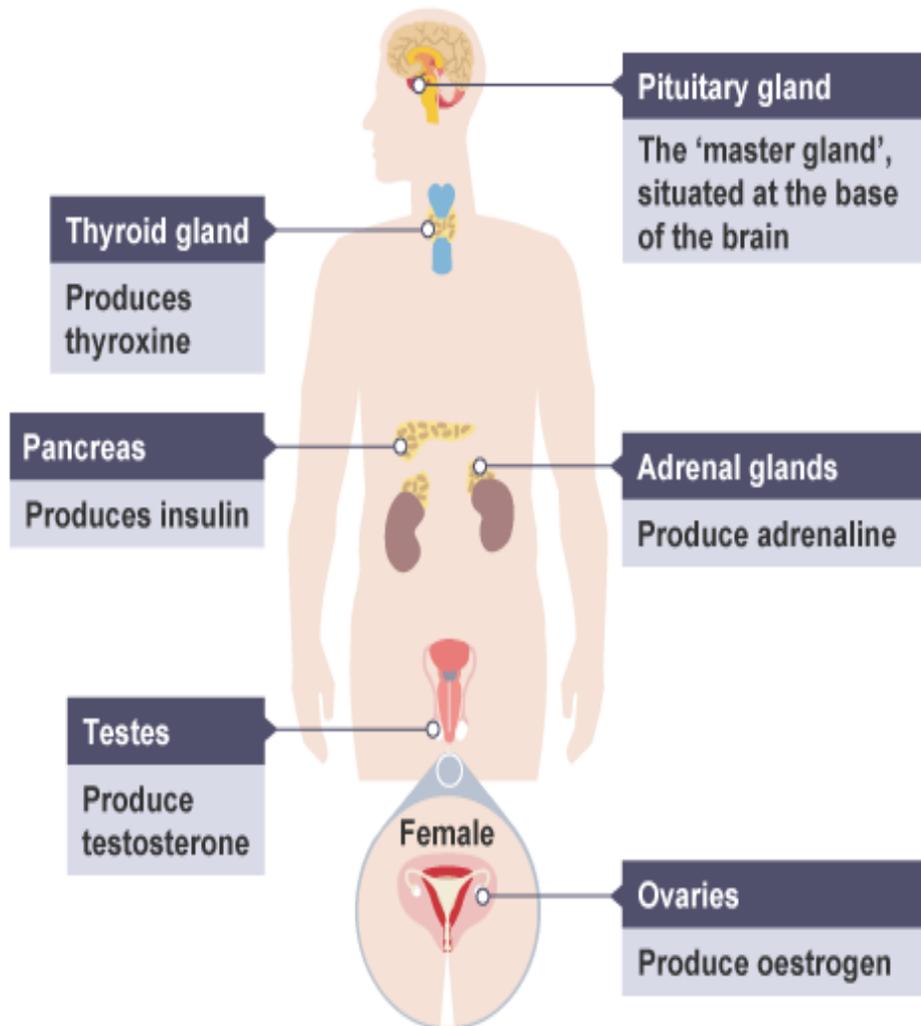
- ▶ A hormone is a chemical substance, produced by a gland and carried in the bloodstream, which alters the activity of specific target organs.
- ▶ Hormones control things in organ and cells that need constant adjustment
- ▶ Hormones are produced in various glands called endocrine glands and these glands make the endocrine system.
- ▶ Hormones effects are **slow** but relatively **long-lasting**.
- ▶ An example of this is the release of the hormone adrenaline, which is released by the adrenal gland.

## The Endocrine system

- ▶ The **endocrine system** consists of many **endocrine glands** that release **specific hormones** into the **blood**.
- ▶ **Endocrine glands** in the human body:
  1. **Pituitary Gland**– The pituitary gland (known as the ‘master gland’) releases lots of **hormones** that regulate body conditions and also some that act on **other glands**. This causes **specific hormones** to be released and a change to occur, e.g. releases **thyroid stimulating hormone (TSH)** that causes the **thyroid** to release **thyroxine**.
  2. **Thyroid**– Produces **thyroxine** that helps regulate rate of **metabolism**, among other things.
  3. **Pancreas**– Produces **insulin** which is important in controlling **blood glucose** levels.
  4. **Adrenal Gland**– Produces **adrenaline** which is involved in **fight or flight responses**.
  5. **Ovaries**– Produces **oestrogen** in **females** which is a vital part of the **menstrual cycle**.

## B5: Homeostasis and Response

6. **Testes**– Produces **testosterone** in **males** which control puberty and **sperm production**.



# Comparing Nerves and Hormones

- ▶ **Hormones** and **nerves** are both important methods of transporting messages around the body but are very different:

## 1. Nerves

- ▶ They are made up of **neurons** that carry **electrical impulses** (and **chemical neurotransmitter** at **synapses**) whereas **hormones** are **chemicals** that are transported in the **blood**.
- ▶ **Nerves** are used to transport messages that require a **rapid response** because they work much quicker than hormones.
- ▶ Example: blinking, lightning etc

## 2. Hormones

- ▶ **Hormones** are used when a message requires a **long response** because nerve impulses only act for a very short time.
- ▶ Hormones continue creating a response until they get **broken down**.
- ▶ Example : growth hormones

### Comparison between the endocrine and nervous system

Comparison	Nervous system	Endocrine system
Speed of the action	Very rapid	Can be slow
Nature of the message	Electrical impulses, travelling along nerves	Chemical messages, travelling in the bloodstream
Duration of the response	Usually completed within seconds	May take years before completed
Area of response	Often confined to one area of the body - response is localised	Usually noticed in many organs - response is widespread
Examples of processes controlled	Reflexes such as blinking; movement of the limbs	Growth; development of reproductive system

**B5: Homeostasis and  
Response**

**ASM Tuition Academy**